

This Page Is Inserted by IFW Operations
and is not a part of the Official Record

BEST AVAILABLE IMAGES

Defective images within this document are accurate representations of the original documents submitted by the applicant.

Defects in the images may include (but are not limited to):

- BLACK BORDERS
- TEXT CUT OFF AT TOP, BOTTOM OR SIDES
- FADED TEXT
- ILLEGIBLE TEXT
- SKEWED/SLANTED IMAGES
- COLORED PHOTOS
- BLACK OR VERY BLACK AND WHITE DARK PHOTOS
- GRAY SCALE DOCUMENTS

IMAGES ARE BEST AVAILABLE COPY.

As rescanning documents *will not* correct images,
please do not report the images to the
Image Problem Mailbox.

THIS PAGE BLANK (USPTO)



INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification 6 :

H04M 1/23, 1/27

A1

(11) International Publication Number:

WO 98/10571

(43) International Publication Date:

12 March 1998 (12.03.98)

(21) International Application Number:

PCT/GB97/02429

(22) International Filing Date:

9 September 1997 (09.09.97)

(30) Priority Data:

9618800.8

9 September 1996 (09.09.96)

GB

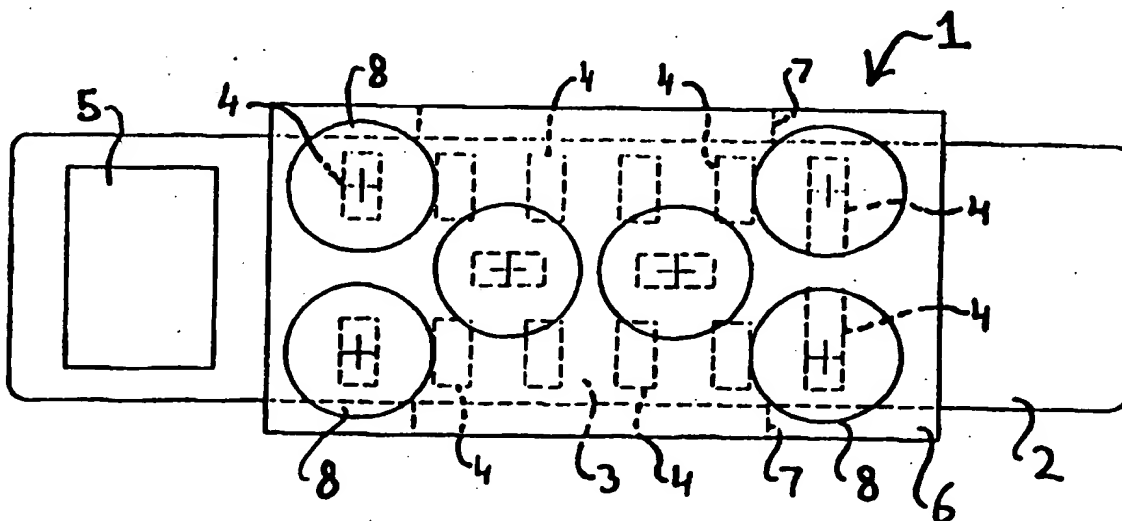
(71)(72) Applicant and Inventor: GREEN, Victor, Brian [GB/GB];
The Chaseley Trust, South Cliff, Eastbourne BN20 7JH
(GB).(74) Agent: FRANK B. DEHN & CO.; 179 Queen Victoria Street,
London EC4V 4EL (GB).

(81) Designated States: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, GH, HU, ID, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZW, ARIPO patent (GH, KE, LS, MW, SD, SZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG).

Published

*With international search report.**Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.*

(54) Title: TELEPHONE KEYPAD ADAPTOR



(57) Abstract

A keypad adaptor (1) mounted on a conventional or preferably mobile telephone (2) by, e.g., a U-shaped bracket (7), comprises a keypad plate (6) over the telephone keypad (3) and includes buttons (8) above selected ones of the keys (4) of the telephone (2) so as to allow a user to call telephone numbers stored in a memory of the telephone (2). The buttons (8) are preferably larger and more spaced out than the keys (4), so as to facilitate their use by physically impaired persons.

FOR THE PURPOSES OF INFORMATION ONLY

Codes used to identify States party to the PCT on the front pages of pamphlets publishing international applications under the PCT.

AL	Albania	ES	Spain	LS	Lesotho	SI	Slovenia
AM	Armenia	FI	Finland	LT	Lithuania	SK	Slovakia
AT	Austria	FR	France	LU	Luxembourg	SN	Senegal
AU	Australia	GA	Gabon	LV	Latvia	SZ	Swaziland
AZ	Azerbaijan	GB	United Kingdom	MC	Monaco	TD	Chad
BA	Bosnia and Herzegovina	GE	Georgia	MD	Republic of Moldova	TG	Togo
BB	Barbados	GH	Ghana	MG	Madagascar	TJ	Tajikistan
BE	Belgium	GN	Guinea	MK	The former Yugoslav Republic of Macedonia	TM	Turkmenistan
BF	Burkina Faso	GR	Greece	ML	Mali	TR	Turkey
BG	Bulgaria	HU	Hungary	MN	Mongolia	TT	Trinidad and Tobago
BJ	Benin	IE	Ireland	MR	Mauritania	UA	Ukraine
BR	Brazil	IL	Israel	MW	Malawi	UG	Uganda
BY	Belarus	IS	Iceland	MX	Mexico	US	United States of America
CA	Canada	IT	Italy	NE	Niger	UZ	Uzbekistan
CF	Central African Republic	JP	Japan	NL	Netherlands	VN	Viet Nam
CG	Congo	KE	Kenya	NO	Norway	YU	Yugoslavia
CH	Switzerland	KG	Kyrgyzstan	NZ	New Zealand	ZW	Zimbabwe
CI	Côte d'Ivoire	KP	Democratic People's Republic of Korea	PL	Poland		
CM	Cameroon	KR	Republic of Korea	PT	Portugal		
CN	China	KZ	Kazakhstan	RO	Romania		
CU	Cuba	LC	Saint Lucia	RU	Russian Federation		
CZ	Czech Republic	LJ	Liechtenstein	SD	Sudan		
DE	Germany	LK	Sri Lanka	SE	Sweden		
DK	Denmark	LR	Liberia	SG	Singapore		
EE	Estonia						

- 1 -

TELEPHONE KEYPAD ADAPTOR

The present invention relates to a telephone accessory and equipment, and in particular to a
5 telephone accessory and equipment for assisting physically impaired persons to use conventional and/or mobile telephones.

A problem often encountered by physically impaired persons, such as the elderly or disabled, is that the
10 keys of a telephone are too small and close together for successful operation of the telephone. For example, a user may accidentally hit two keys together or the wrong key. This is a particular problem with mobile telephones, which are designed especially to be small
15 and compact, and therefore to have small keypads and keys.

According to the present invention, there is provided a telephone keypad adaptor for use with a telephone having a number storing facility, the adaptor
20 comprising a keypad having a plurality of keys thereon arranged such that, when the adaptor is mounted on the telephone, the keys of the adaptor keypad are able to operate selected keys of the telephone keypad, including number retrieval keys of the telephone.

From a further aspect, the present invention provides a telephone keypad adaptor for a telephone having a number storing facility, which, when mounted on the telephone, provides a keypad having fewer keys than
25 the normal keypad of the telephone, these adaptor keys operating keys of the telephone which enable numbers stored by the telephone to be called.
30

Viewed from a still further aspect, the present invention provides a telephone with a number storing facility and a secondary keypad, the secondary keypad in
35 use extending over the main keypad area of the telephone and having fewer keys than the main keypad of the

- 2 -

telephone, these keys of the secondary keypad operating keys of the main keypad that enable telephone numbers stored in the memory of the telephone to be called.

5 The keypad adaptor of the present invention is able to provide a keypad for a telephone having fewer keys thereon than the normal keypad of the telephone. This makes the telephone much easier to use, as the correct keys are much easier to press, and keys not of use may be masked by the adaptor pad so that they cannot be
10 pressed by accident.

For a similar size of adaptor keypad to that of the telephone's normal keypad, the use of fewer keys enables the adaptor keys to be spaced further apart and/or allows them to be larger, so that there may be more of a
15 strike area for each key and less chance of hitting an adjacent key by accident.

By focusing on the memory keys, not only can the keys be made larger and more spaced apart, but also the number of actions required to call a number may be
20 reduced compared to the number of actions required to actually dial a number. This again increases the ease of use.

By using a telephone with a memory, and by facilitating the use of such a telephone by selecting
25 and highlighting the keys needed to call a number in the memory, and by enabling these keys to be larger in size and/or spaced further apart, without necessarily increasing the size of the telephone itself to any great extent, the invention facilitates the use of telephones
30 by those who would otherwise find their use very difficult, if not impossible.

As the invention is able to provide these features through the use of an accessory for telephones already on the market, it does not require the manufacture of
35 special dedicated telephones.

The invention is especially appropriate for use with mobile telephones. These tend to have memories with scroll functions, and, in such cases, the selected

- 3 -

keys of the telephone may comprise connect ("send"), disconnect ("end"), memory scroll up, memory scroll down and select, as well as for example an on/off key and one of the digit keys, for example the digit five, which
5 would represent for example the number most frequently used and stored in the memory.

In use, a user may press e.g. the 5 key to obtain the most used telephone number, and scroll up or down to other less frequently used numbers (Preferably, these
10 other numbers are listed in order of their usage, so that the next two most frequent numbers are at memories 4 and 6, etc.). Once the required number has been located by scrolling, the user may press select and then press connect to call the number. Once finished, the
15 user may press disconnect.

In the case of conventional telephones, e.g. those mounted on desks or walls and connected to a telephone point by a cable, these may for example store up to twenty numbers, using the keys 0 to 9 to give ten
20 numbers, and the same digits and a "shift" key to give another ten.

The adaptor keypad may select only some of the keys of these 0 to 9 digits, e.g. four keys, strategically placed so that the adaptor keys are able to remain
25 suitably spaced and sized when mounted above them. Thus, the adaptor keypad for a conventional telephone may select a suitable number of the 0 to 9 digits as well as the shift key and preferably also a loudspeaker key.

30 Of course, the precise keys selected by the adaptor keypad may be different from the above depending on the telephone's operation and key arrangement.

The keypad adaptor keys and keypad may take any suitable forms to provide the required functions.

35 The adaptor keys themselves may have strike areas of suitable sizes and shapes to enable knuckles or fists to be used to strike the keys. In addition, the keys may be shaped and sized to facilitate operation by an

- 4 -

operating tool, such as for example a rod held in the mouth of a user.

5 In a preferred embodiment, the upper surface of each adaptor key is concave to reduce the chances of a user's finger, hand, etc., or operating tool, from slipping from the key.

10 The adaptor keys may be colour-coded or otherwise marked and/or shaped, e.g. as up/down scroll arrows, so as for example to enable a user with limited sight to more easily select the correct keys.

15 The adaptor keys may be mounted directly above respective ones of the telephone keys, so that when pressed, they in turn press directly onto these respective telephone keys. This arrangement provides a particularly simple system. It would, however, be possible to have the adaptor keys offset from their respective telephone keys, if necessary, for example should two required keys be adjacent one another on the telephone keypad. This may be achieved in any suitable
20 manner, such as for example by suitable mechanical lever means.

25 In one preferred embodiment, the keypad may comprise a plate having holes therein through which the adaptor keys are mounted, each adaptor key in use lying directly above a respective one of the selected keys of the telephone keypad.

30 According to a further aspect of the present invention, there is provided a telephone keypad adaptor for use with a telephone having memory storing facilities, the adaptor comprising a plate; means for locating and securing the plate over the keypad of the telephone; and a plurality of buttons mounted in the plate which project through the plate and which are
35 adapted to move in a direction substantially perpendicular to the plane of the plate, the buttons engaging keys of the telephone keypad that allow numbers stored in the telephone to be called, the buttons having a greater striking area and/or spacing than the keys of

the telephone keypad.

Each adaptor key may have an upper portion for operation by the user and a lower portion which engages the selected telephone key when the adaptor key is pressed. For example, the adaptor keys may comprise a pad providing a striking area for the user on one side of the plate, a stem passing through the plate, and a second pad opposite to the selected key of the telephone keypad.

Means, such as spring means, may be provided for urging the adaptor keys out of contact with the telephone keys when they are not being pressed. The keys may also be guided and prevented from rotation, by for example providing splines along the key stems which engage in corresponding grooves in the holes in the plate, or for example by suitably shaping the plate holes and the stems of the keys to include e.g. a straight side, such as by using square or rectangular holes and stems.

The adaptor may be mounted on the telephone in any suitable manner, e.g. in a clip-on or clamped manner. In one preferred form, one or more brackets are provided which connect with a plate of the keypad to hold the plate in place over the telephone keypad. Alternatively, for example, the plate could be held in place by a strap, which could be elasticated, with spacer means for holding the adaptor keypad a suitable distance from the telephone keypad.

In the case of a mobile telephone, the adaptor may form part of a cradle in which the telephone is mounted, e.g., to the seat of a wheelchair or to a wall or a car mounting unit.

Preferably, the adaptor is removable from the telephone for example to allow for cleaning of the telephone and adaptor, and to enable the telephone to be used normally or to be programmed or reprogrammed by a user or by a carer of the user. In the case of a mobile telephone, removal of the adaptor may additionally

- 6 -

facilitate recharging of the battery.

It is preferable that the adaptor is configured so that it enables the continued use of any ear piece and/or microphone attachments, etc., where provided on the telephone.

Adaptors could be made specifically for one or more models of telephone, and different makes of telephone will often have similar dimensions and keypad arrangements, so that one adaptor may accommodate a range of models. The adaptor may also be adjustable to accommodate variations in telephone design, such as in respect of their thickness, width and key arrangements. For example, the adaptor may have a keypad plate on which the keys are mounted, which has a number of holes therein, only some of which are used, with the particular holes used being dependent on the telephone keypad arrangement on which it is to be mounted. Also, these holes may be elongate, to allow for more accurate placement of the adaptor keys over the telephone keys. Further, the adaptor may be mounted to the telephone by adjustable mounting means, which may accommodate different sizes, e.g. widths and thicknesses of the telephone, and also distances of the adaptor keypad from the telephone. For example, the mounting means could comprise a strap, which could be elasticated, and adjustable spacer means between the adaptor keypad and the telephone keypad.

The idea of a second keypad which allows larger keys to be used is itself inventive, without necessarily having to use only memory function keys, and, viewed from a further aspect, the present invention provides a keypad adaptor for a telephone comprising keys of larger size than those of the telephone keypad, the adaptor keys operating respective ones of the keys of the telephone keypad. In this case, the adaptor keypad may include the same number of keys as the telephone keypad, or a significant number of them. The adaptor keypad may therefore be larger than the keypad of the telephone.

- 7 -

Also, the telephone need not then be one which stores telephone numbers, as the keys of the adaptor could be selected to operate the dialling digit keys of the telephone. As the adaptor keys would be larger,
5 dialling would still be easier than when using the original telephone keypad without the adaptor. The invention also extends to a telephone with such an adaptor.

10 An embodiment of the present invention will now be described, by way of example only, with reference to the accompanying drawings, in which:

Fig. 1 shows a plan view of an adaptor according to one embodiment of the present invention; and

15 Fig. 2 shows a side elevation of the adaptor of Fig. 1.

Referring to both figures, a keypad adaptor 1 is mounted on a mobile telephone 2.

The mobile telephone 2 has a keypad 3 comprising keys 4, and a display screen 5.

20 Adaptor 1 has a keypad plate 6 which is mounted on the telephone 2 by a U-shaped mounting bracket 7 shown by dashed lines in Fig. 2 in order that the other features of the adaptor 1 may be clearly seen.

25 Adaptor 1 includes six buttons 8 mounted on the plate 6 above selected ones of the keys 4 of the telephone 2, the keys 4 being chosen so as to allow a user to call telephone numbers stored in a memory of the telephone 2.

30 Each button 8 of the adaptor comprises an outer portion 9 (shown in cross-section in Fig. 2), which the user presses to operate the corresponding opposite key 4 of the telephone, a central shaft 10 passing through the plate 6, and an inner portion 9 which contacts with the opposing key 4 when the button 8 is pressed.

35 Central shaft 10 is cross-shaped in section, and is able to move relative to the plate 6 through a correspondingly cross-shaped hole in the plate 6. The cross-shaped section helps to guide the buttons 8 and to

- 8 -

prevent their rotation.

5 The inner portion 10 is preferably formed from a resilient material such as rubber or the like. Means, such as a spring mounted between the outer portion 9 and the plate 6, may be provided to bias the buttons 8 up out of contact with the keys 4 when the buttons 8 are not pressed.

10 The striking surfaces 12 of the buttons 8 are concave. Some users need to use an aid such as a rod held in the mouth to press the buttons 8, and the concave surfaces 12 help to prevent slippage of these rods.

15 In this embodiment, the keys 4 selected are the connect, disconnect, display list of memory numbers, scroll memory numbers up, scroll memory numbers down, and select memory number keys.

20 The contact surfaces 12 of each button are larger and their centres more spaced apart than those of the keys 4 of the telephone, and thus enable a user to more easily make a telephone call without for example pressing a wrong key or two keys together. Keys not required are masked by the plate 6, and so cannot be pressed by accident.

25 The mounting bracket 7 may be connected to the plate 6 in any suitable manner, and may provide a clip-on and/or screw construction. It may form part of a cradle by which the mobile telephone 2 is mounted to a vehicle seat, a wheelchair, wall or some other structure.

30 Various alternatives and modifications on the above design are of course possible, and the adaptor keypad and mounting means may take any suitable forms and be made from any suitable materials. The mounting bracket 7 may for example be integral with plate 6, and/or plate 35 6 may be pivotally mounted to one side of the bracket 7. Alternatively, the bracket 7 may be separate from plate 6, but attached by screws, or in a clip manner or the like. The bracket 7 could be replaced e.g. by side arms

- 9 -

on the plate 6 having flange portions which clip behind the body of the telephone, or could be replaced by an elasticated strap, with spacer means provide between the plate and the telephone.

5 The preferred embodiment of the invention is shown in use with a mobile telephone, and this provides a particularly advantageous system. The invention is however also suited to use with a conventional telephone e.g. mounted on a desk or a wall and connected to a
10 telephone point by a cable, suitable changes being made as appropriate, such as which keys are selected and the mounting arrangement used.

 In a further variation, the adaptor keypad may have buttons 8 for the dialling keys of the telephone keypad,
15 and possible other keys of the telephone also. This could make the keypad larger, but would still provide the advantage of larger press buttons.

- 10 -

Claims

1. A telephone keypad adaptor for use with a telephone having a number storing facility, the adaptor comprising a keypad having a plurality of keys thereon arranged such that, when the adaptor is mounted on the telephone, the keys of the adaptor keypad are able to operate selected keys of the telephone keypad, including number retrieval keys of the telephone.

10

2. The adaptor of claim 1, wherein the adaptor keys are spaced further apart than the keys on the telephone with which it is used.

15

3. The adaptor of claim 1 or 2, wherein the adaptor keys are larger than the keys on the telephone with which it is used.

20

4. The adaptor of any preceding claim, wherein the adaptor keys have strike areas configured to enable a user to operate the adaptor using their knuckles or fists.

25

5. The adaptor of any preceding claim, wherein the adaptor keys have strike areas configured to enable a user to operate the adaptor using an operating tool.

30

6. The adaptor of any preceding claim, wherein the upper surface of each adaptor key is concave.

7. The adaptor of any preceding claim, wherein the adaptor keys are colour-coded.

35

8. The adaptor of any preceding claim, wherein telephone keys not of use are masked by the adaptor.

9. The adaptor of any preceding claim, wherein the adaptor is configured for use with a mobile

- 11 -

telephone.

10. The adaptor of any preceding claim, wherein the selected keys of the telephone include connect,
5 disconnect, memory scroll up, memory scroll down and select keys.

11. The adaptor of claim 10, wherein the selected keys include one of the digit keys corresponding to one
10 of the telephone numbers stored in the telephone.

12. The adaptor of any of claims 1 to 8, wherein the selected telephone keys include keys of the 0 to 9 digits.
15

13. The adaptor of claim 12, wherein a shift key of the telephone is further selected.

14. The adaptor of any preceding claim, wherein a
20 loudspeaker key is one of the selected telephone keys.

15. The adaptor of any preceding claim; wherein the adaptor keys are mounted directly above respective ones of the telephone keys.
25

16. The adaptor of any preceding claim, wherein the adaptor keypad comprises a plate having holes therein through which the adaptor keys are mounted, each adaptor key in use lying directly above a respective one
30 of the selected keys of the telephone keypad.

17. The adaptor of claim 16, wherein keys are not mounted in all of the holes, with the particular holes used being dependent on the telephone keypad arrangement
35 on which the adaptor is to be mounted.

18. The adaptor of any preceding claim, wherein each adaptor key has an upper portion for operation by

- 12 -

the user and a lower portion which engages the selected telephone key when the adaptor key is pressed.

5 19. The adaptor of any preceding claim, wherein means are provided for urging the adaptor keys out of contact with the telephone keys when they are not being pressed.

10 20. The adaptor of any preceding claim, wherein the adaptor is mounted on the telephone in a clip-on or clamped manner.

15 21. The adaptor of any of claims 1 to 18, wherein one or more brackets are provided which connect with a plate of the keypad to hold the plate in place over the telephone keypad.

20 22. The adaptor of any of claims 1 to 18, wherein the plate is held in place by a strap, with spacer means for holding the adaptor keypad a suitable distance from the telephone keypad.

25 23. The adaptor of any of claims 1 to 19, for use with a mobile telephone, wherein the adaptor forms part of or is mounted on a cradle in which the telephone is mounted.

30 24. A telephone keypad adaptor for a telephone having a number storing facility, which, when mounted on the telephone, provides a keypad having fewer keys than the normal keypad of the telephone, these adaptor keys operating keys of the telephone which enable numbers stored by the telephone to be called.

35 25. A telephone with a number storing facility and a secondary keypad, the secondary keypad in use extending over the main keypad area of the telephone and having fewer keys than the main keypad of the telephone,

- 13 -

these keys of the secondary keypad operating keys of the main keypad that enable telephone numbers stored in the memory of the telephone to be called.

5 26. A telephone keypad adaptor for use with a telephone having memory storing facilities, the adaptor comprising a plate; means for locating and securing the plate over the keypad of the telephone; and a plurality of buttons mounted in the plate which project through
10 the plate and which are adapted to move in a direction substantially perpendicular to the plane of the plate, the buttons engaging keys of the telephone keypad that allow numbers stored in the telephone to be called, the buttons having a greater striking area and/or spacing
15 than the keys of the telephone keypad.

27. A keypad adaptor for a telephone comprising keys of larger size than those of the telephone keypad, the adaptor keys operating respective ones of the keys
20 of the telephone keypad.

28. A telephone and adaptor therefor, the adaptor comprising keys of larger size than those of the telephone keypad, the adaptor keys operating respective
25 ones of the keys of the telephone keypad.

1/1

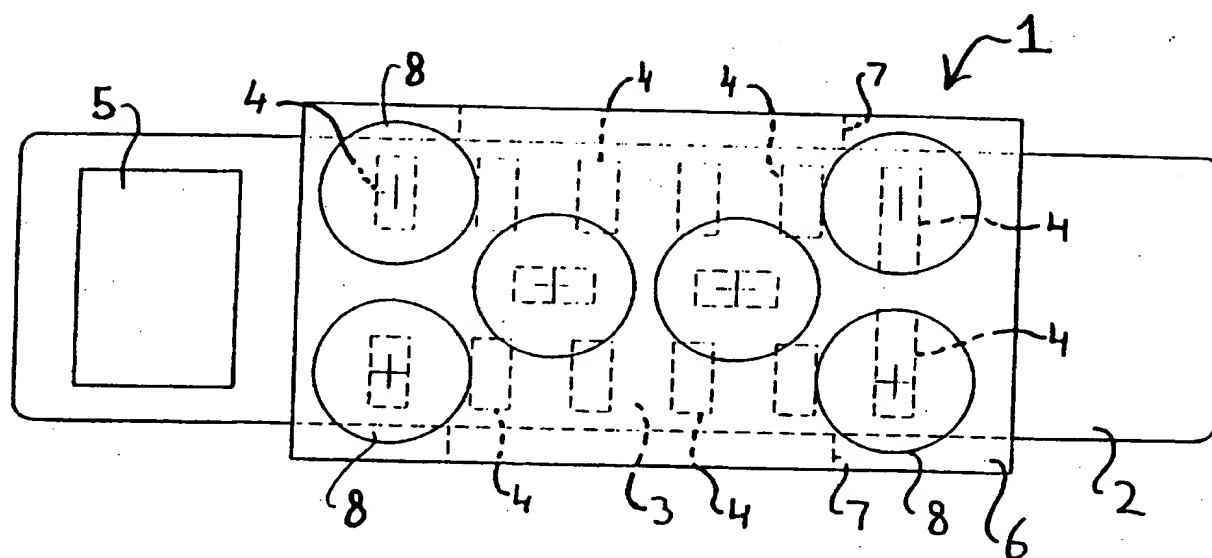


Fig. 1

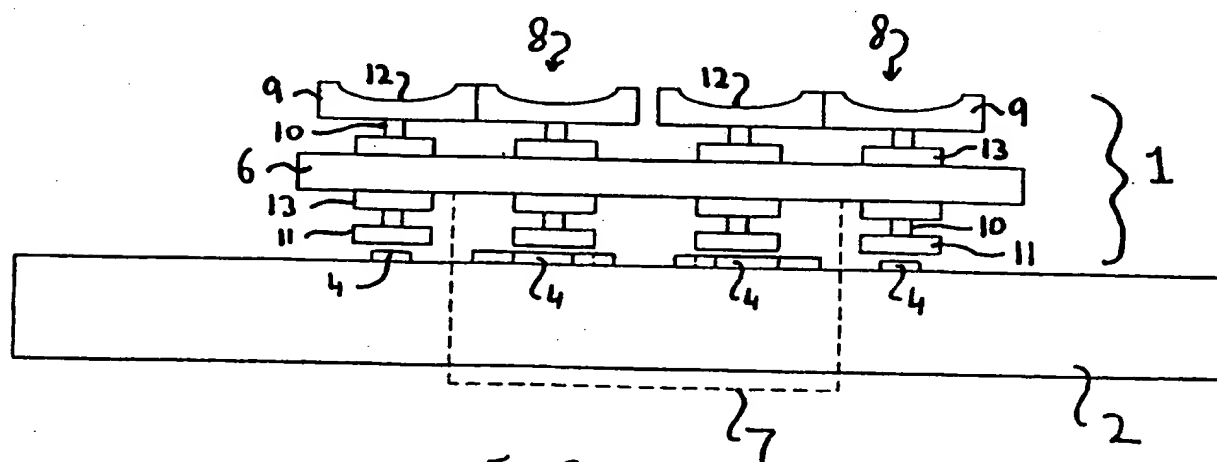


Fig. 2

INTERNATIONAL SEARCH REPORT

International Application No

PCT/G8 97/02429

A. CLASSIFICATION OF SUBJECT MATTER
IPC 6 H04M1/23 H04M1/27

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 6 H04M

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	IL 93 998 A (SCHREIBER JACOB; NURANI RAANANA; NURANI BENJAMIN) 19 January 1996 see page 4, line 1-8 see page 5, line 22 - page 10, line 10; figures 1-8	1-5, 7, 8, 11-28
Y		6, 9, 10
X	EP 0 354 367 A (SANYO ELECTRIC CO) 14 February 1990 see column 2, line 1 - column 3, line 2 see column 4, line 15 - column 6, line 28; figures 1-21	1-5, 7, 8, 11-28
Y		6, 9, 10
X	DE 30 22 877 A (KUHN MANFRED) 24 December 1981 see the whole document	1-5, 8, 11, 12, 15, 24-28
	-/-	

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another, citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"Z" document member of the same patent family

Date of the actual completion of the international search

12 December 1997

Date of mailing of the international search report

21/01/1998

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl.
Fax: (+31-70) 340-3016

Authorized officer

Golzio, D

INTERNATIONAL SEARCH REPORT

International Application No

PCT/GB 97/02429

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	GB 2 264 196 A (BRITISH TELECOMM) 18 August 1993 see page 1, line 3-15; figures 1-3 see page 3, line 15 - page 5, line 15 ---	6
Y	US 5 365 570 A (BOUBELIK MARK J) 15 November 1994 see column 3, line 42-64; figures 18,1C ---	9
Y	EP 0 721 272 A (NOKIA MOBILE PHONES LTD) 10 July 1996 see column 2, line 37 - column 3, line 35; figures 1-3 ---	10
Y	US 5 444 775 A (TOBISH JOHN J) 22 August 1995 see abstract; figures 8-10 ---	6,9
A	US 3 903 376 A (NISHIKIORI AKIRA) 2 September 1975 ---	1
A	EP 0 524 652 A (RANSOME IND LIMITED) 27 January 1993 see abstract ---	1,24-26
A	US 3 778 553 A (RACKMAN M) 11 December 1973 see abstract; figures 1-3 -----	1

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/GB 97/02429

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
IL 93998 A	19-01-96	NONE	
EP 0354367 A	14-02-90	AU 621385 B AU 3797589 A CA 1316617 A KR 9710836 B US 4989240 A	12-03-92 11-01-90 20-04-93 01-07-97 29-01-91
DE 3022877 A	24-12-81	NONE	
GB 2264196 A	18-08-93	NONE	
US 5365570 A	15-11-94	NONE	
EP 0721272 A	10-07-96	FI 950079 A	06-07-96
US 5444775 A	22-08-95	NONE	
US 3903376 A	02-09-75	CA 941532 A DE 2111537 A FR 2092404 A GB 1308402 A	05-02-74 23-09-71 21-01-72 21-02-73
EP 0524652 A	27-01-93	GB 2258584 A,B US 5487108 A	10-02-93 23-01-96
US 3778553 A	11-12-73	AU 5812073 A	16-01-75

THIS PAGE BLANK (USPTO)